Oldman River Dam

Environmental Advisory Committee

Final Recommendations

Oldman River Dam

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Table of Contents

Message from the Chair ---------- 1

Preamble ---------- 3

Statement of Principle ---------- 4

Recommendations

1. Project Operation and Policy ---------- 5
   - A. Protection of the Environment ---------- 5
   - B. Stored Water ---------- 7
   - C. Maintaining Models and Data ---------- 8

2. Mitigation and Monitoring ---------- 9
   - A. Water Quality ---------- 9
   - B. Vegetation Mitigation Program ---------- 10
   - C. Wildlife Mitigation Program ---------- 12
   - D. Fish Mitigation Program ---------- 13

3. Social, Cultural and Economic Issues ---------- 18
   - A. Cost/Benefit Analysis ---------- 18
   - B. Interpretative Centre ---------- 18
   - C. Recreation Areas ---------- 18
   - D. Social Impact Monitoring ---------- 21
   - E. Grazing Issues ---------- 22
   - F. Limit on Water Allocation Expansion ---------- 22
   - G. Water Conservation Objectives ---------- 23
   - H. Security ---------- 23

Conclusion ---------- 24

Report Highlights ---------- 25

Glossary ---------- 29

Oldman River Dam Environmental Advisory Committee

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Message from the Chair

The Oldman River Dam Environmental Advisory Committee (EAC) was established by the Minister of Environmental Protection in August of 1993. In general, the committee's mandate is to provide input into the wise management of water in the Oldman River Basin and the Oldman River Dam environmental mitigation program for the benefit of the people and environment of southern Alberta.

I would like to thank the Minister for the opportunity I had to serve on this committee and to thank the members of the committee for their dedication. I wish also to extend a special thank you to the staff members from government offices who provided a tremendous amount of time, effort and expertise. It has indeed been a pleasure to chair this committee.

Since the Oldman River Dam started filling in 1991 to this present year of 2001 the committee has had the benefit of seeing the flood of the century in 1995 and periods of below normal snow pack and spring runoff. These diverse situations have provided valuable information and the opportunity to see the mitigation under a wide range of conditions.

After considerable public consultation and much guidance and technical data from various government departments, an interim report was completed and presented to the Minister in August of 1996. Eight recommendations were submitted. These recommendations were reviewed and accepted by the Minister with the exception of the 'use of stored water'.

In response to the Minister's request for more public consultation on the use of stored water the EAC conducted public meetings in Fort Macleod and Lethbridge with concerned groups and organizations. The EAC also published and distributed several newsletters and encouraged public input.

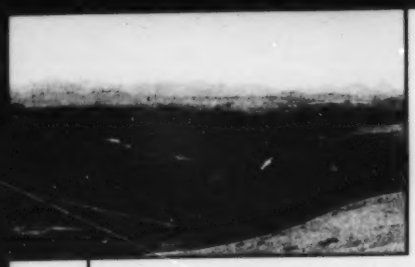


Photo: Oldman River

Message from the Chair - cont'd

With the information gathered from the meetings, the input from the public sector and the latest technical reports from the government, the information was once again reviewed and the draft report prepared and presented to the public for their final input. After reviewing the public concerns the final report was completed. There remains a need to address the concerns on that section of the river that runs through the Peigan Nation.

The priority issue as seen by this committee is the protection of the environmental aspects of this river. It is a concern that we do not over allocate the water. We feel there should be ongoing public consultation and evaluation in regards to the operational strategies.

Tom Ferguson

Tom Ferguson
Chairman,
Oldman River Dam Environmental Advisory Committee

Preamble

The Oldman River Dam Environmental Advisory Committee (EAC) was appointed by the Minister of Environmental Protection in 1993 to provide advice on the Oldman River Dam project with respect to the management of water and the environmental mitigation program. The Committee was charged with the responsibility of making recommendations regarding the short and long-term operation of the dam to the Minister, including the implementation of the mitigation and monitoring programs.

In 1996, the Environmental Advisory Committee prepared a set of eight interim recommendations. The recommendations were accepted and approved by the Minister of Environmental Protection in September 1998.

Since then, the EAC has continued to work with the various stakeholders affected by the Oldman River Dam project. The Committee has also done an in-depth review of the operational plans for the Oldman River Dam and results from the mitigation and monitoring programs. This document provides the Committee's final recommendations for the Minister of Environment.

The Committee recognizes that the Oldman River Dam was built for multi-purpose use for the citizens of Alberta. Therefore, the recommendations are broad in perspective to reflect the diversity of uses.

In this document, reference to the Oldman River, unless specifically noted, refers to all of the Oldman River upstream and downstream of the dam as well as the Castle and Crowsnest rivers and their tributaries.

Statement of Principle

The Oldman River Dam must be used to sustain both the environment and the economic community of southern Alberta. The operation of the Oldman River Dam must not diminish the viability of the aquatic, riparian and upland species native to the parts of the Oldman, Castle and Crowsnest river valleys affected by the project.

Recommendations

One Project Operation and Policy

Operation of the Oldman River Dam must, first and foremost, focus on the protection of the aquatic and riparian environment of the Oldman River.

A. Protection of the Environment

The protection of the entire aquatic and riparian environment is, and must remain, the most critical consideration in the operation of the Oldman River Dam (ORD). This protection depends on providing supportive instream flows. The EAC recommends that the instream flows prescribed for reaches downstream of the ORD be reviewed and updated to include needs beyond those met by the fish rule curve to ensure protection of the entire aquatic and riparian environment.

Alberta Environment uses the Water Resources Management Model to evaluate water use scenarios. Instream Flow Needs (IFN) is one component of that computer model. Currently, IFN are determined by establishing a minimum flow rate that provides sufficient quantity and quality of fish habitat to ensure fish survival.

The EAC accepts that the Instream Flow Incremental Methodology is adequate to estimate the flow needs for fish habitat. However, the Committee recommends that the current criteria be expanded so that other characteristics not currently considered in deriving the IFN are addressed.

The EAC recommends that the following criteria be included:

- the need for high volume flow to address:
  1. maintenance of river channel structure and substrate;
  2. recharge of floodplain groundwater levels;

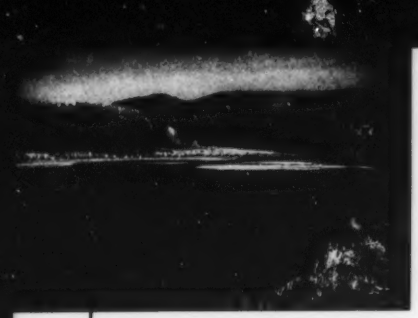
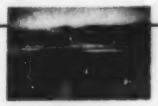


Photo: Oldman River at Lethbridge



Recommendation #1 - cont'd

3. recruitment of riparian cottonwoods. The Committee recommends that when conditions permit, the dam be operated to provide the flow necessary for cottonwood seedling recruitment and long-term forest maintenance. The Committee is satisfied post dam variability in river flows has been adequate to support riparian cottonwoods. However, the period of record since construction of the dam is short. The number of sustained events at or near bankfull needs to be reviewed to ensure that the necessary overbank flooding events continue as part of the Operation Strategy.

   The cottonwood study needs to be expanded through the Peigan First Nation lands to determine the impact of operations on that area and to identify flows needed to sustain the cottonwood community along that reach.

- the flow needs to support total ecosystem health including, but not limited to:

  1. water quality requirements for instream processes, and to minimize the occurrence of fish disease and parasites.
  2. variable flows to maintain the complexity of biotic communities, and ecological functions including energy flow, nutrient dynamics, and predator/prey relationships.
  3. water clarity and algae concerns below the dam need to be addressed. More specific detail on this issue is provided later in the document.

The EAC recommends that the Oldman Dam Operation Strategy be amended to accommodate revisions to the Instream Flow Needs. The Committee does not support the reduction of current minimum flows when natural inflow is less than the minimum identified through the Instream Flow Incremental Methodology process because of the potential degradation of downstream habitat, fisheries stress and water quality objectives. Consideration must be given to the preservation of the fishery and aquatic life, which has established and developed under reservoir release flows.

Photo: Mitigation habitat ponds

Recommendation #1 - cont'd

The reservoir storage designated to ensure that the minimum flow can be sustained until a subsequent runoff event should be reviewed to determine its adequacy. Operating experience at the dam, over the past eight years, should be used in the analysis.

The EAC further stresses that current and future water demands must not compromise the Oldman River ecosystem. An education program is required to ensure that the people of Alberta develop an appreciation of the natural processes of the Oldman River valley. Provincial policies may also be needed to ensure that floodplain development does not limit the options for responsible river flow management.

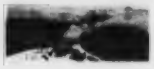
B. Stored Water

The Committee recommends that the priority use for stored water is the protection of the aquatic and riparian environment. In times of a water shortage, the remaining stored water should be allocated on an equitable basis to all licensees according to need regardless of licensed priority. This recommendation is based on the modelling presented to the committee at the time of this review. A limit on licensed allocations is urgently needed in the Oldman River Basin to ensure all licensed water uses remain viable.

The EAC is strongly opposed to stored water being routinely utilized to support commitments outside of the Oldman sub-basin of the South Saskatchewan River Basin. The IFN and licensed allocations within each sub-basin need to be met by supply within that sub-basin to ensure the ecological integrity of each river.

Photo: Oldman River

Recommendation #1 - cont'd



C. Maintaining Models and Data

The Committee is satisfied that the interim recommendation for the verification of planning models has been met. The Committee recommends that the Water Resources Management modelling process continue to be refined. This would include revisions to IFN and the failure criteria for the irrigation supply deficit. The water demands for irrigation must also be completed. The Committee also recommends implementation of a public consultation process for any changes to IFN. A full review should be completed every 10 years, with results reviewed by public committee.

The Committee further recommends that there be no expansion of water allocations beyond what continued modelling shows is a sustainable balance between supply and demand without impacting river health as defined by either the present or future Instream Flow Needs.

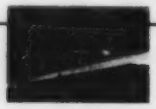


Photo: Mitigation wetland complex

two Mitigation and Monitoring

Monitoring must be continued so that all mitigation programs are maintained and updated, as new information becomes available. The Government of Alberta must set aside sufficient funds to ensure that any mitigation work in progress, or that may be required in the future, is satisfactorily completed.

A. Water Quality

The Committee is pleased the chemical composition of the water in the Oldman River Dam Reservoir is rated as excellent. The EAC recommends that water quality monitoring continue as part of the Oldman River Basin Water Quality Initiative to ensure that quality is maintained in the long term.

Although the physical characteristics of the reservoir water are excellent, water clarity and algae growth in the river downstream of the Oldman River Dam have been identified as a specific, serious concern that must be addressed. This unanticipated change in the river system has worsened over the past three years and has had a detrimental impact on the recreational use of the river. The Committee is concerned that the increases in algae could be affecting the no net loss of recreational fishing opportunity objective of the fisheries mitigation program. It is recommended that the Department determine the cause for the turbidity and build up of algae downstream of the dam and implement measures to eliminate the problem.

The Committee also recommends that Alberta Environment provide new, long-term funding to existing programs such as Cows & Fish to improve water quality through better management of riparian zones. Additional long term funding for fencing, alternate water supplies and shelter away from watercourses should be available to landowners to keep livestock from direct access to watercourses. This would allow for increased willow, poplar and grass establishment thereby reducing erosion problems and improving water quality.

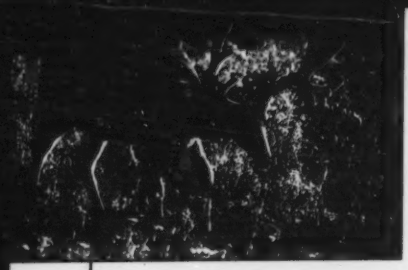


Photo: Mule Deer

B. Vegetation Mitigation Program

The EAC recognizes two distinct areas that have been impacted by the construction of the Oldman River Dam. The downstream riparian zone has been affected predominantly by the operation strategy of the Oldman River Dam, whereas the project area has been affected by loss of habitat due to the flooding of the reservoir.

1. Downstream Riparian Areas

   The riparian cottonwood forest downstream from the Oldman River Dam is the largest, most complex forest of its kind in Canada. Prior to construction of the ORD, the natural river flows included wide variations in volume and timing that favor the establishment and maintenance of this unique gallery forest.

   The Committee recommends that dam operations continue to provide flows necessary for cottonwood recruitment in the Oldman River valley. The EAC recommends the completion of an Oldman River Cottonwood Management Plan based on the most recent scientific work. The plan should include a review of the effect of the river on cottonwoods through the Peigan Nation. The Oldman River Cottonwood Management Plan should be included in the Oldman River Dam operating plan to guide day-to-day operations to provide flows needed to sustain the downstream cottonwood community.

   Due to concerns with the interference to cottonwood regeneration, the Committee also recommends that the Department investigate biological controls or other research, for leafy spurge and expansion of leafy spurge control beyond the reservoir area.

Photo: Brown Thrasher

2. Project Lands

The original strategy of the wildlife habitat mitigation plan was to replace lost habitat units by protecting, and enhancing existing habitat or by developing new habitats on project lands.

The Committee is not satisfied that the mitigation program has fully met the objectives of compensating for lost habitat. The EAC recommends that mitigation efforts for wildlife habitat continue until the replacement of the original number of habitat units has been achieved. Alberta Environment should revisit the original objectives of the mitigation plantings and refocus efforts on the successes of the program to date. Based on the monitoring program, enhancement of existing habitat has been more successful than attempts to create new habitat. The EAC also recognizes that natural regeneration has contributed to the wildlife habitat compensation program and accepts that these gains may also be credited to the overall mitigation objective.

The EAC identifies a need for the development of a specific planting plan for the ORD reservoir area.

The plan needs to:

- Identify long-range planting activity priorities.
- Establish long-term test plots.
- Use native plants and local cultivars.
- Connect areas of cover and maximize the use of natural topographic features.

Contracts for planting should be based on the successful establishment of planted materials. Local landowners could be contracted to assist in the maintenance.

The EAC also has strong concerns with blowing sediments from mud flats exposed when reservoir levels are low. It is recommended that the mitigation planting plan incorporate cover areas to reduce the blowing sediment problem.

Terry Clayton

Photo: Cattle grazing

C. Wildlife Mitigation Program

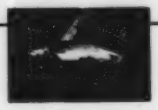
The Committee recommends that additional work be done to meet the original targets established for the wildlife mitigation program, particularly in the establishment of the vegetative cover. The work needed includes:

- A comparison of the current number of habitat units with the number needed to reach proposed mitigation targets.
- An evaluation of the habitat potential of check dams and wetlands to ensure that the intended purpose of each has been met.
- Identification of areas that can be developed for the benefit of any under-represented species and habitats as identified by ongoing monitoring.
- An assessment of the four primary habitat areas to identify the potential for further enhancement for a variety of wildlife.

The Committee recognizes that areas within the Provincial Recreational Area are grazed by cattle and need to be managed to optimize the production of wildlife habitat units. The Department is encouraged to continue working with the grazing leaseholders to resolve ongoing issues pertaining to weed control, fencing, and water access.

The Committee further recommends that the Department continue to monitor raptor populations until the drop in numbers of Prairie Falcons from 15 pairs in 1989 to six pairs in 1999 can be explained. Mitigation of the causes is needed where the cause can be related to reservoir construction, use, or operation. Signage must be maintained for Wildlife Control areas established to protect raptor nesting sites. The signage should outline the reasons for the restrictions and enhance public education opportunities. Multiple information sites are required if an interpretative centre is not built. (Page 18)

Photo: Rainbow Trout



Recommendation #2 - cont'd

The Committee also recommends that monitoring of mule deer numbers continue and that measures are implemented to maintain a viable number on project lands. Additional habitat placement and enhancement work is required to attract deer away from roads and buildings. This may be accomplished through landowner incentives and co-operation. Public information packages are required to inform landowners of techniques to minimize human-wildlife conflicts.

D. Fish Mitigation Program

The objective of the fish mitigation program is "no net loss of fishing opportunity." Alberta Environment used six questions to evaluate the effectiveness of the fisheries mitigative effort. The EAC is very concerned that despite an intensive monitoring effort, some of these questions have not been fully answered. The Environmental Advisory Committee does not believe there is sufficient evidence to conclude that the "no net loss" objective has been achieved.

The Alberta Environment evaluation is based on the following questions:

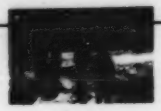
Habitat Creation

1) Is the structural integrity of the mitigation structures being maintained over time?

   The EAC believes that although the integrity of individual structures has been maintained over time, there has been a significant departure from the intended distribution of mitigation habitat. Mitigation structures in the Northfork Oldman, Castle and Crowsnest rivers were heavily damaged due to the flood of 1995. Damaged structures were repaired in the Crowsnest, but not in the Northfork and Castle. To make up for the damaged/destroyed structures, habitat enhancement downstream of the Oldman River Dam was expanded to the point where it now provides the majority of the mitigation program.

Terry Clayton

Photo: Angling on the Oldman River



2) Is the target habitat type being maintained over time?

The EAC does not believe that target habitats have been maintained. The shift in the distribution of habitat to downstream reaches following the flood of 1995, has necessitated a change in the relative contribution of the various mitigation habitat types. Mitigation on upstream reaches focuses on expanding deep water holding habitat whereas mitigation on the downstream reaches enhances existing deep water pools. The EAC recognizes a need for a maintenance and inspection program to insure that the quality of target habitats established both upstream and downstream is being maintained.

Fish Utilization

3) Are target species/life stage fish (catchable trout) attracted to enhanced sites in numbers comparable to nearby natural high quality sites?

This question cannot be answered, because the necessary baseline data have not been acquired.

4) Are population densities of catchable-sized trout greater in enhanced river reaches than in nearby low quality reaches?

An adequate data set has yet to be acquired to answer this question. The necessary data include, but are not limited to:

- Completing an inventory of fish populations in the target rivers, and;
- Evaluating whether the focus is on the right species for the long-term health of the river or whether mitigation activities are having a negative effect on certain species.

Angler Catch

5) Do numbers of trout caught in the project area equal or surpass the number caught prior to the dam being built?

The EAC believes that adequate baseline data have not been acquired to answer this question.

Photo: Fish hatchery truck

6) Are the catch rates for individual anglers as good or better than prior to the dam being built?

This information should be available from creel surveys. However, the data presented to the EAC to date are inconclusive.

The EAC regards the shift in the mitigation program from upstream of the dam to downstream, to be a significant alteration to the mitigation program. This change has not been adequately addressed to determine whether the "no net loss" objective has been met. The Committee believes that the studies of the biological responses to the physical mitigation structures (Questions 3 through 6) do not show the "no net loss" requirement has been met.

The EAC believes that overall, the evidence to support the "no net loss" requirement is too inconclusive to show the objective has been met.

The EAC recognizes that a number of projects have been completed to enhance the downstream fisheries of the Oldman River:

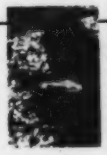
- Brown trout stocking program.
- Lethbridge fish passage.
- 2001 brown trout stocking program below the new fish passage.

The EAC recommends that fisheries mitigation work continue and proposes the following specific components be included in a revised plan:

- A monitoring program must be designed in concert with the planning and implementation of any additional mitigation work. The objectives of the monitoring work must be clearly defined and quantified so that an effective monitoring can be completed. Necessary baseline data should be collected to validate additional mitigation work.

Terry Clayton

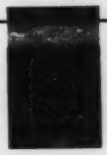
Photo: Bull Trout



Recommendation #2 - cont'd

- Continue funding for long term monitoring and the protection of all fish species in the reservoir and downstream of the Oldman River Dam. This needs to include establishing a maintenance and inspection program to ensure integrity of mitigation structures on the Oldman River and a contingency plan, complete with resources, if inspection programs identify deficiencies in the structures.
- Alternate means of reaching mitigation goals of no net loss of recreational opportunities downstream of the dam need to be formalized. This needs to include mitigative work downstream as far as the confluence of the Oldman and St. Mary rivers and expanding the spawning bed potential in the tailwater area.
- The upstream mitigative program must be sustained at current levels and include a refocusing of mitigative activities on Pincher Creek rather than the Castle and Crowsnest rivers. This is a result of the dam blocking access to upstream spawning on the Castle, Crowsnest and Oldman rivers. Pincher Creek is the only creek available to trout for spawning downstream of the dam. Spawning areas need to be expanded within Pincher Creek to ensure the genetic diversity of rainbow trout downstream of the dam.
- A mechanism to ensure funding to reach and/or implement alternative mitigation targets/goals is secured.
- Maintain the brown trout stocking program until the population is proven to be self-sustaining. The program should include stocking upstream of the Lethbridge Northern Irrigation District headworks to enhance the tailwater fishery.
- Develop a plan to address loss of bull trout below the dam. Although this species was not originally part of the mitigation program, it is considered a valuable recreational species in the area. Supporting the downstream bull trout will require investigation through specific research efforts.
- Assess the cost and feasibility of protecting native bull trout by providing artificial spawning beds below the dam.
- Ensure the operation strategy for the Oldman Dam includes a provision for flows that are critical to the reproduction and

Photo: Oldman River at Lethbridge



Recommendation #2 - cont'd

incubation periods for fish species. The strategy must address temperature adjustments in the tailwater and provide scouring flows to prepare spawning beds. The Committee does not support any reduction to present minimum flows when natural inflow is less than outflow because of the potential impact on downstream resources.

- Ensure that the Committee's concerns regarding river clarity and the increased algae growth downstream of the dam are addressed through a specific departmental program. The algae growth could be impacting the "no net loss of fishing opportunity" objective. This will be a critical issue because the focus of the mitigative measures has been moved to the downstream reach.
- Prevent fish from entering the Lethbridge Northern main canal from the Oldman River by the design and installation of a fish exclusion device.
- Rather than spending funds to replace the type of structures lost during the 1995 flood, the Committee recommends that funds should be dedicated to bank habitat protection and river water quality in the Castle, Crowsnest and Oldman rivers and Pincher Creek.

Photo: Oldman River downstream of Lethbridge

three Social, Cultural and Economic Issues

As stated in the interim recommendations, socio-economic change is expected to continue in the region as a consequence of the presence and operation of the Oldman River Dam.

A. Cost/Benefit Analysis

The Committee recommends that a cost/benefit analysis be conducted to determine if the predicted benefits have been realized and outweigh the costs of project construction and mitigation. The Committee further recommends that the collected information should be sufficiently detailed to allow its use as an appropriate benchmark for future evaluation and as a benefit to any future projects planned.

B. Interpretative Centre

The Committee recommends that an interpretative centre be constructed on or near the dam site which would include such items as a history of the Peigan Nation, impact of the dam on water management, impact of the project on irrigation, etc. with models, mapping and illustrations to portray the Oldman River system as a part of the South Saskatchewan River Basin from the mountains to the Saskatchewan border.

C. Recreation Areas

The Committee agrees in principle with the contents of the Oldman River Dam Provincial Recreation Area Management Plan (PRA) and recommends that this Plan be finalized as soon as possible. The plan should include an agreement to work with the Municipal District of Pincher Creek No. 9 when developments within the recreation area are being considered. The Committee makes the following further recommendations regarding the management of the Oldman River Dam Provincial Recreation Area:

Photo: Cottonwood Campground

Recommendation #3 - cont'd

- ❑ Minimize bank disturbances in public areas by eliminating unnecessary access points.
- ❑ Include a specific requirement in contracts with private operators to minimize environmental disturbances to river and reservoir areas.
- ❑ Use a public consultation process before significantly altering current recreational facilities.

The Committee also recommends the following site-specific improvements to the Oldman River Dam PRA:

Boulder Run Day Use Area

- ❑ Improve river access at the upstream end by installing a small boat launch.

Cottonwood Campground

- ❑ Improve disabled access facilities.
- ❑ Continue stocking fish ponds to provide angling opportunities for children, disabled, and seniors.
- ❑ Review options to improve water quality for recreational contact in fish ponds.

RV Campground

- ❑ Improve the appearance of the water tower.
- ❑ Maintain existing building restrictions and standards.

Windy Point

- ❑ Plant trees to enhance site amenities. Use existing wind screens to protect new plantings and improve initial survival and growth.
- ❑ Address concerns related to the offshore island.
- ❑ Address safety concerns related to the boat launch.

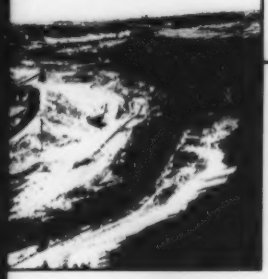
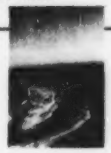


Photo: Boulder Run day use area



Recommendation #3 - cont'd

Island View Campsite

- ❑ Install and use a watering system to support tree growth.
- ❑ Replant trees at campsites to provide wind protection.

North Fork Day Use Area

- ❑ Maintain for day use only.
- ❑ More trees should be planted to enhance site amenities.
- ❑ Review the need for a watering system to support tree growth.

Downstream Recreational Areas

- ❑ River turbidity and algae growth need to be rectified to optimize recreational values of sites at least as far downstream as Fort Macleod.

Cottonwood Bridge

- ❑ The east end of the Oldman River Dam portage route is a heavy use area. Toilet and garbage facilities at the boat launch area are required.

Todd Creek

- ❑ Maintain for day use only.

Stevick's Pond (Castle Wildlife Sanctuary)

- ❑ Restore the function of all three ponds at the Wildlife Sanctuary. Evaluate bringing the river back to the original diversion point as part of this process.
- ❑ Improve public awareness of this site and its location.

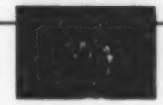


Photo: Cottonwoods walking tour

D. Social Impact Monitoring

The Committee recommends that socio-economic impacts related to the presence and operation of the Oldman River Dam continue to be monitored to identify any long-term effects.

In particular, further study is required to determine the environmental and social impacts of the Oldman River Dam project on the Peigan First Nation. The EAC supports the need for a comprehensive environmental assessment of the Oldman River Dam project on the river valley through the Peigan First Nation. Peigan Elders need to be encouraged to record an oral history of the project area.

Weak regeneration of riparian habitat through the Peigan First Nation has been identified as a specific concern. It appears that a lack of overbank flooding is reducing seeding events for vegetation and eliminating the filling and scouring of oxbows. This habitat is critical to the Peigan First Nation because of the cultural significance of willows and sweetgrass found along the floodplain. There is a need to determine levels for overbank flooding within the reserve to meet regeneration requirements.

Although the Committee recognizes that the river is still stabilizing from the 1995 flood, investigation of the possible loss of rainbow trout spawning grounds is needed. Mitigation may be needed to maintain rainbow trout through the Peigan First Nation.

Water quality, flood attenuation and the use of stored water are significant issues for downstream landowners and communities. The use of stored water and water quality are referenced elsewhere in the document. Although the Committee is satisfied that the operational plan for the Oldman River Dam provides some flood attenuation for downstream landowners, it conflicts with the need for occasional overbank flooding to maintain the aquatic and riparian systems. The development of a plan that also supports the long-term health of the river valley is vital.

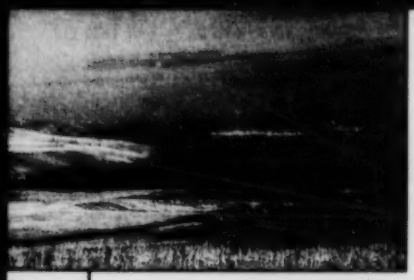


Photo: Riparian gallery forest

Recommendation #3 - cont'd

The Committee conducted meetings with the landholders adjacent to the Reservoir to provide an opportunity for their input. Ongoing discussions with landowners will be required to address concerns that result from the presence and operation of the Dam.

E. Grazing Issues

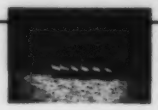
Because grazing is a useful tool in managing project lands, the interaction between Department staff and adjacent landowners must be continued. The Department needs to establish a permanent process to address the concerns of permit holders as they arise. The Committee specifically notes the need for coordinating the timing of weed spraying activities with turnout dates of cattle into grazing areas and the need to add knapweed to the list of species for control.

F. Limit on Water Allocation Expansion

The Committee recommends that a limit be placed on water allocations from the Oldman River system to minimize the occurrence of supply failures to licensees in the future. The limit should be set based on the best information available regarding instream needs, future demands from all sectors and variability in supply.

The EAC recommends that stored water is used to meet licensed needs in an equitable manner independent of license seniority, after the long-term health of the aquatic and riparian ecosystem is assured.

Photo: White Pelicans



G. Water Conservation Objectives

The EAC recommends that a licence for Water Conservation Objectives, as provided for under the *Water Act*, be applied for with a January 1, 1999 priority for the Oldman River. The Water Conservation Objectives should specifically protect a minimum flow, incorporate instream flow needs and include a clause to allow for overbank flow during specifically determined conditions.

H. Security

Security measures should be addressed relating to protection of the dam structure.

Conclusion

Role of the Environmental Advisory Committee

Overall, the EAC believes that the Oldman River dam is capable of doing the job that it was designed and constructed to do. Caution must be exercised to prevent an over allocation of the water supply that would significantly impede the protection of the riparian and aquatic environment.

At the Minister's discretion, the EAC suggests reviving this committee in 10 years to evaluate the success of further mitigation and implementation of the recommendations. A Departmental report to the public in 5 years will allow for continued input from individuals and groups.

Report Highlights

Section 1 Project Operation and Policy

A. Protection of the Environment

The Instream Flow Needs for the Oldman River Basin be reviewed and updated so they protect the entire aquatic and riparian ecosystem. (Page 5)

Current criteria for the IFN needs to be expanded to include other characteristics not presently considered. (Page 5. See pages 5 & 6 for specifics of expanded criteria.)

The operating strategy for the Oldman Dam is amended to accommodate revised Instream Flow Needs. (Page 6)

The Oldman River Dam is operated to support cottonwood seedling recruitment and long term forest maintenance. (Page 6)

B. Stored Water

The priority use for water stored in the Oldman River Reservoir is the protection of the aquatic and riparian environment. (Page 7)

C. Maintaining Models and Data

The water modelling process is continued with a full review by public committee every 10 years. (Page 8)

Water allocation is limited to what modelling shows is a sustainable balance between instream needs, supply, and demand. (Page 8)

Photo: Oldman River at Lethbridge

Section 2 Mitigation and Monitoring

A. Water Quality

The water quality monitoring be continued as part of the Oldman River Basin Water Quality Initiative. (Page 9)

The cause of increased turbidity and algae growth downstream of the Oldman River dam be determined and eliminated. (Page 9)

Programs such as Cows and Fish are continued to better manage riparian zones. (Page 9)

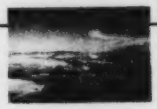
The dam is operated to support cottonwood recruitment in the Oldman River Valley. (Page 9)

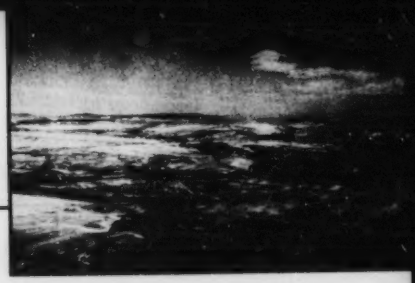
B. Vegetation Mitigation Program

Completion of an Oldman River Cottonwood Management Plan. (Page 10)

Completion of additional enhancement vegetation for wildlife habitat until the planned number of habitat units has been achieved. (Page 10. See further specifics on pages 10 & 11 under Wildlife Mitigation Program.)

Mitigation plantings be used to mitigate sediment blowing from mud flats exposed at low reservoir levels. (Page 11)





C. Wildlife Mitigation Program

Continue monitoring of raptor populations until the decline in numbers can be explained and mitigated if related to the Oldman River Dam project. (Page 12)

Continue monitoring and managing the mule deer population to maintain it at a viable level. (Page 12)

D. Fish Mitigation Program

Fisheries monitoring be continued and a revised mitigation plan be completed and implemented. (Page 13. See pages 13 - 17 for specific components to be included in a revised plan.)

Section 3 Social, Cultural and Economic Issues

A. Cost/Benefit Analysis

Completion of a cost/benefit study to determine if predicted benefits have been realized. (Page 18)

B. Interpretative Centre

Construction of an interpretative centre at or near the dam site. (Page 18)

C. Recreation Areas

Finalize the Oldman Dam PRA Management Plan as soon as possible. (Page 18)

Management of the PRA continue to minimize environmental degradation by eliminating unnecessary access points, and adding clauses to the operations contracts. (Page 18)

Photo: Fish Passage at Lethbridge

A public consultation process be used when significantly altering the recreational facilities. (Page 18)

Site improvements be carried out as specified for each of the recreational facilities. (Pages 18 & 19)

D. Social Impact Monitoring

The socio economic impacts related to the presence and operation of the dam needs further monitoring to identify long-term affects. (Page 21)

E. Grazing Issues

Establish a permanent process to address issues. (Page 22)

F. Limit on Water Allocation Expansion

A limit be placed on water allocations to minimize the occurrence of supply failures. (Page 22)

Stored water be used to meet licensed needs in an equitable manner independent of seniority of license. (Page 22)

G. Water Conservation Objectives

A licence for Water Conservation Objectives be issued for the Oldman River with a January 1, 1999 priority. (Page 23)

H. Security

Security measures need to be addressed. (Page 23)

Glossary

Allocation ---------- The amount of water designated for a user or group of users by the Province of Alberta, through licence or permit, that may be removed from a river, stream or lake.

Biotic ---------- Pertaining to living organisms. For example, the interaction between predators and prey is a biotic interaction.

Biotic Factor ---------- A characteristic of the environment, that arises from living organisms (distinct from physical factors).

Catchable trout ---------- A size category of rainbow trout that could be legally harvested from foothills streams by recreational anglers.

Checkdams ---------- A small dam constructed in a stream channel to capture and store intermittent flow.

Creel Survey ---------- A sampling program involving interviews and inspection of individual angler catches to estimate angling pressure; a survey of the recreational fishing that quantifies the number of fish caught.

Ecosystem ---------- A community of plants, animals and other organisms that are linked by energy and nutrient flows and that interact with each other and with the physical environment.

Fish Rule Curve ---------- The guidelines used by managers when operating water management structures to ensure the instream needs of fish are met.

Gallery Forest ---------- A collection of large over-arching deciduous trees forming a dense canopy.

Habitat ---------- The place where a plant and/or animal population lives and its surroundings, both living and nonliving; includes the provision of life requirements such as food and shelter. It is the environment where a plant or animal will naturally be found.

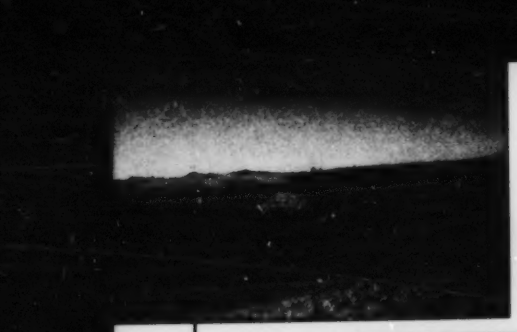
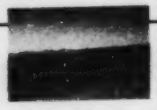


Photo: Prairie falcon nesting habitat



Glossary - cont'd

Habitat Units ---------- A measure of the amount of the environment that may be used by a particular species. One parcel of land may provide considerably more Habitat Units for one species than another species depending on the environmental needs of each species.

Instream Flow Incremental Methodology --------- A procedure for determining the amount of habitat available for a species in a river or stream at different flow levels. Assessment is based on the physical flow characteristics in the channel related to the biological tolerances of the different life stages of the species being assessed.

Instream Flow Needs ---------- Science based river flow values needed to protect the aquatic ecosystem. The main components of Instream Flow Needs include fish habitat, water quality, riparian vegetation, channel structure, and overall health of the aquatic environment.

Mitigation ---------- Action taken to alleviate potential adverse effects. Mitigation normally requires replacement of like with like in close proximity. Commonly used to mean compensation for damage done.

Native Species ---------- A species that occurs naturally in an area (ie: not introduced).

No Net Loss ---------- The desired outcome of an environmental mitigation compensation program whereby the land base around a project is altered to incorporate all of the characteristics of the area lost due to the completion of a project. Typically the no-net-loss criteria is limited to those species or habitat types that are of interest with respect to the particular project.

Overbank Flooding ---------- General flooding within a river valley when the flow of the river is too great to be transported within the normal confines of the river channel.

Primary Habitat Areas ---------- Parcels of land known to have particularly high value to one or more species of wildlife. High value may be due to importance of the area to a species to fulfill a particular part of its life cycle, or due to the very high quality of habitat for a species found within the area.

Photo: Oldman River Dam

Glossary - cont'd

Raptor ---------- Birds of prey of the order Strigiformes or Falconiformes that hunt by seizing prey from the air and carrying it off; characterized by hook-tipped beaks and talons.

Reaches ---------- Sections of rivers normally of similar physical characteristics.

Riparian Zone ---------- The physical and biological environment adjacent to a river or stream that significantly influences and/or is significantly influenced by the stream or river; the zone that is wetted by periodic surface or subsurface water from the river or stream.

Stored Water ---------- Water that is held in a reservoir, headpond, or canal. Water may only be stored according to the conditions of a licence issued by the Government of Alberta. Once stored, the water may be used as desired within the terms of the licence by the person or institution holding the licence.

Sustainable ---------- The rate of use of resources whereby replenishment of the resource is more rapid than the rate of consumption.

Substrate ---------- The material upon or within which a plant or animal lives or grows.

Tailwater ---------- The river reach immediately downstream of the dam. The reach that is most affected by the operation of the dam.

Topographic Map ---------- Maps that present both the horizontal and vertical positions of the features represented. Distinguished from a planimetric map by the addition of relief in measurable form.

Upland Species ---------- Species that are generally found on lands away from the river valleys and low lying wetland areas. These species are not necessarily excluded completely from the lower areas.

Water Quality Initiative ---------- A co-operative program between the Government of Alberta, private industry, and public and private institutions and associations to investigate the present condition of water quality in the Oldman River basin. The initiative will also identify the impacts of current uses on water quality and project possible future water quality conditions.

Current & Past Membership

Current Membership

Tom Ferguson	Chairman MD of Pincher Creek
Brian Nauta	Vice Chair Lethbridge Northern Irrigation District
Henry Bosman	Environmental Community
Andrew Hurly	Academic and Research Community (University of Lethbridge)
Janet Walker	Local Resident
John Calpas	Local Resident
Frank Duske	Fish and Game Association
Bob Lowe	Local Resident
Ed Martin	City of Lethbridge
Dave McGee	Alberta Environment (Provincial Representative)
Rick McLean	Department of Fisheries and Oceans (Federal Representative)
Vacant	Peigan First Nation

Current membership would like to acknowledge contributions of past members, who through their meetings, provided the foundation for the work culminating in this report.

Past Members

Hilton Pharis	Past Chairman Local Resident
Don LeBaron	Past Vice Chair City of Lethbridge
Stewart Rood	Academic and Research Community (University of Lethbridge)
Shawn Patience	Fish and Game Association
Bob Bergen	Local Resident

Current & Past Membership - cont'd

Dennis Olson	Local Resident
John Vandenberg	Lethbridge Northern Irrigation District
Cliff Wallis	Alberta Environmental Network
Harley Bastien	Local Resident
Jim Byrne	Academic and Research Community (University of Lethbridge)
Wayne Cleaver	Fish and Game Association
Ken Brant	Department of Fisheries and Oceans (Federal Representative)
Steve Drummond	Department of Fisheries and Oceans (Federal Representative)
Doug Clark	Alberta Environment (Provincial Representative)
Jake Theisen	Alberta Environment (Provincial Representative)
Reg Watkins	Department of Transport (Federal Representative)

The Oldman River Dam Environmental Advisory Committee would like to acknowledge and thank the contributions of Alberta Environment, other Provincial and Federal Government Departments, and the public, for their input and expertise. We would also like to make special mention of the dedication and commitment to the project that John Mahoney (Alberta Sustainable Resource Development) exhibited. His regular attendance at meetings and ability to answer questions was greatly appreciated.